

## CLAIMS

1. A method of processing subband signals for cancelling an undesired effect on a signal, the method comprising steps of:

analysing a primary signal, which has a signal affected by an undesired signal, and a reference signal corresponding to the undesired signal, to produce frequency domain primary signals and frequency domain reference signals in a plurality of subbands;

processing the frequency domain primary signal and the frequency domain reference signal using an adaptive filter in each subband, comprising operating on at least the frequency domain reference signal to improve the convergence of the adaptive filter in each subband; and

synthesizing the outputs of the adaptive processing blocks to output a time domain signal in which the effect of the undesired signal has been cancelled.

2. A method of claim 1, wherein the operating step includes the step of whitening the input of the adaptive filter by spectral emphasis.

3. A method of claim 1, wherein the operating step includes the step of whitening the input of the adaptive filter by adding noise.

4. A method of claim 1, wherein the operating step includes the step of whitening the input of the adaptive filter by decimating the frequency domain primary signal and frequency domain reference signal by a factor (DEC) which is less than or equal to an oversampling factor (OS).

5. A method of claim 1, wherein the operating step includes the step of implementing the affine projection algorithm.

6. A method of claim 1, wherein the operating step includes the step of implementing the recursive least squares algorithm.

7. A method of claim 1, wherein the operating step includes the step of employing a double-talk detector to control the adaptation process of the adaptive filter.
8. A method of claim 1, wherein the operating step includes the step of controlling the adaptation step size of the adaptive filter.
9. A method of claim 1, wherein the processing step includes the step of performing non-adaptive noise reduction for eliminating uncorrelated noise.
10. A method of claim 1, wherein the processing step includes the step of performing a cross talk resistant adaptive processing using two adaptive filters in each subband.
11. A method of claim 1, wherein the undesirable signal is an echo signal or a noise signal.
12. A system for processing subband signals for cancelling an undesired effect on a signal, the system comprising:
  - an analysis filterbank for analysing a primary signal, which has a signal affected by an undesired signal, and a reference signal corresponding to the undesired signal, to produce frequency domain primary signals and frequency domain reference signals in a plurality of subbands;
  - a processing module for processing the frequency domain primary signals and the frequency domain reference signals, including an adaptive filter module in each subband, and a module for operating on at least the frequency domain reference signal to improve the convergence of each adaptive filter; and
  - a synthesis filterbank for synthesizing the outputs of the processing module to output a time domain signal in which the effect of the undesired signal has been cancelled.

13. The system according to claim 12, wherein the module whitens the input of the adaptive filter by spectral emphasis.
14. The system according to claim 12, wherein the module whitens the input of the adaptive filter by adding noise.
15. The system according to claim 12, wherein the module whitens the input of the adaptive filter in each subband by decimating the input of the adaptive filter.
16. The system according to claim 12, wherein the module implements affine projection algorithm in each subband.
17. The system according to claim 12, wherein the module implements the recursive least squares algorithm in each subband.
18. The system according to claim 12, wherein the module includes a double-talk detector to control the adaptation process of the adaptive filter.
19. The system according to claim 12, wherein the module controls the adaptation step size of each adaptive filter.
20. The system according to claim 12, further comprising a non-adaptive noise reduction module for eliminating uncorrelated noise.
21. The system according to claim 12, wherein the processing module includes a cross talk resistant adaptive processing module having a pair of adaptive filters in each subband, which process the frequency domain primary signal and frequency domain reference signal.

**22. The system according to claim 12, wherein the undesirable signal is an echo signal or a noise signal.**